

# **Two Million Years of Art in Human Evolution**

**AH 224 Paleolithic Art, Spring 2012**

**James Harrod, Ph.D.**

Adjunct Instructor in Art History, Maine College of Art, Portland, Maine

Director, Center for Research on the Origins of Art and Religion

[originsnet.org](http://originsnet.org) ([pleistocenecoalition.com](http://pleistocenecoalition.com))

## The Purpose of this Course

1. To gain openness and wonder toward, and appreciation of, this long 2 million year lineage of art-making.
2. To get a feeling for this art and how it reverberates in your own psychic depths, your own creative impulse to art-making, and aspirations.
3. To master some of the basic nomenclature, theory, and information used in the study of Palaeoart.
4. To practice applying critical approaches to analyze Stone Age symbolic behavior and resonances in historic and contemporary art and your own creative process.

**“Emancipate yourselves from mental slavery;  
None but ourselves can free our minds.”**

Bob Marley, ‘Redemption Song’, *Uprising* – from speech, Marcus Garvey, Nova Scotia, 1937

## *Dedication*

*To the spirit of Marija Gimbutas (1921-1994)*

... for her brilliant intellect, warm-hearted generosity and a passionate originality and vision. The greatest teaching is by example. In this case, Marija demanded the highest standards of scholarship from herself as well as from her students. Moreover, she had the courage to speak from her own perceptions and to expand the traditional boundaries of her discipline. As Indo-Europeanist Edgar Polomé wrote in her 1987 festschrift, "There are no words to describe the profoundness of the feelings that link this great scholar to her disciples and this great woman to her numerous friends and admirers."

*Joan Marler, Pacifica Opus Archives*



Marija Gimbutas, Newgrange, 1989  
Michael Everson, *Wikicommons*

**”Then too, the pebble is stone precisely at the stage when it becomes a person, an individual—in other words, the stage of speech.”**

Francis Ponge, ‘The Pebble’  
transl. Fahnestock L. *The Nature of Things*  
(*Taking the Side of Things*)

**“Archeological materials are not mute. They speak their own language. And they need to be used for the great source they are to help unravel the spirituality of . . . our ancestors . . . “**

*Marija Gimbutas, Language of the Goddess: xix*

# A Transdisciplinary Adventure

**Archaeopoetics** – identify, evoke concept of self and its feeling-toned values, meaning-values, ideals; based on evidence and especially symbolic resonances between technology and symbolic behaviors

**Quest for Origins** – search for ‘origins’, curiosity, passion to know,; search for origins of ‘culture’, impulse to culture; curatorial instinct; goddess Cura; psyche as ‘the animated spirit inhabiting this body and relationships’; transmission of originating power from ancestors to heirs

**Mythostratigraphy** – 2 M year prehistory of evolving cultural memes or ‘archetypes’

**Archaeomythology** – symbol, metaphor, myth; identify, decode iconography  
(‘a field that includes archeology, comparative mythology and folklore’, Gimbutas M, *Language of the Goddess*; “interdisciplinary cultural research with particular emphasis on the beliefs, rituals, symbolism, social structure and systems of communication of prehistoric societies”, Marler J, [archaeomythology.org](http://archaeomythology.org))

*combined with transdisciplinary knowledge and practices:*

**Palaeoart** - rock art studies; prehistory of art

**Prehistory of Religions** - comparative mythology / comparative religion / folklore

**Paleoanthropology** - physical/biological anthropology; cultural anthropology, ethnology; anthropology of religion; anthropology of art

**Archaeology + Geology + Ecology + Climatology**

**Paleontology** – fossil bones to reconstruct evolution, speciation, phylotrees

**Primateology**

**Paleolinguistics** – long and short chronologies of language evolution, reconstructions

**Archaeogenetics** – hominid diffusions, mtDNA, Y- and X-DNA, etc.

**Neuroscience** – of tool-making and cultural, symbolic behavior; brain evolution



*And more Dedications*

**Jacques Boucher de Perthes (1788-1868)**

**Louis Laurent Gabriel de Mortillet (1821-1898)**

**Henri Breuil (1877-1961)**

**Pierre Teilhard de Chardin (1881-1955)**

**Annette Laming-Emperaire (1917-1977)**

**André Leroi-Gourhan (1911-1986)**

**Henri Delporte (1920-2002)**

**Alexander Marshack (1918-2004)**

**Marija Gimbutas (1921-1994)**

**Michel Lorblanchet**

**Randall White**

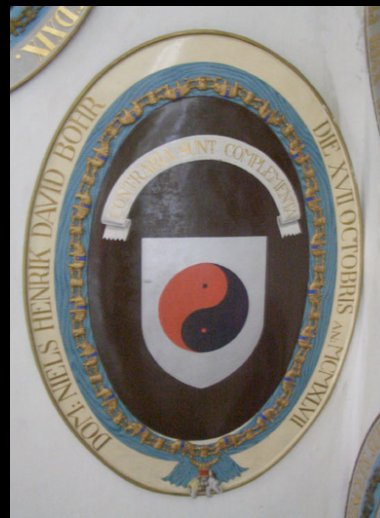
**Francesco d'Errico**

**Jean Clottes**

**Robert Bednarik**

**“A statement whose opposite is false is trivial.  
A statement whose opposite is also true is profound.”**

**Niels Bohr**



*contraria sunt complementa*

**“They got Charles Darwin trapped out there on Highway Five  
Judge says to the High Sheriff, ‘I want him dead or alive  
Either one, I don't care.’**

*Bob Dylan, ‘High Water’, Love and Theft*

## 1982 to 2010: Gallup polls:

The *Gallup Organizations* periodically asks randomly selected American adults about their beliefs on evolution and creation. They have conducted a poll of U.S. adults on at least ten occasions between 1982 and 2010. By keeping the wording of their questions almost identical, each year's results are comparable to the others. The main change that they have made is to use "human beings" in place of "man" -- presumably because it is less sexist. Keeping the questions unchanged facilitates the detection of trends.

Belief system>	Creationist view	Theistic evolution	Naturalistic Evolution
Beliefs-->	God created man pretty much in his present form at one time within the last 10,000 years or so.	Human beings have developed over millions of years from less advanced forms of life, but God guided this process.	Human beings have developed over millions of years from less advanced forms of life, but God had no part in this process.
Year			
1982-JUL	44%	38%	9%
1993-JUN	47	35	11
1997-NOV	44	39	10
1999-AUG	47	40	9
2001-FEB	45	37	12
2004-NOV	45	38	13
mid-2006	46	36	13
Spring -2007	43	38	14
mid-2008	44	36	14
2010-DEC	40	38	16

These polls typically involve slightly over 1,000 subjects. The margin of error is  $\pm 4$  percentage points.

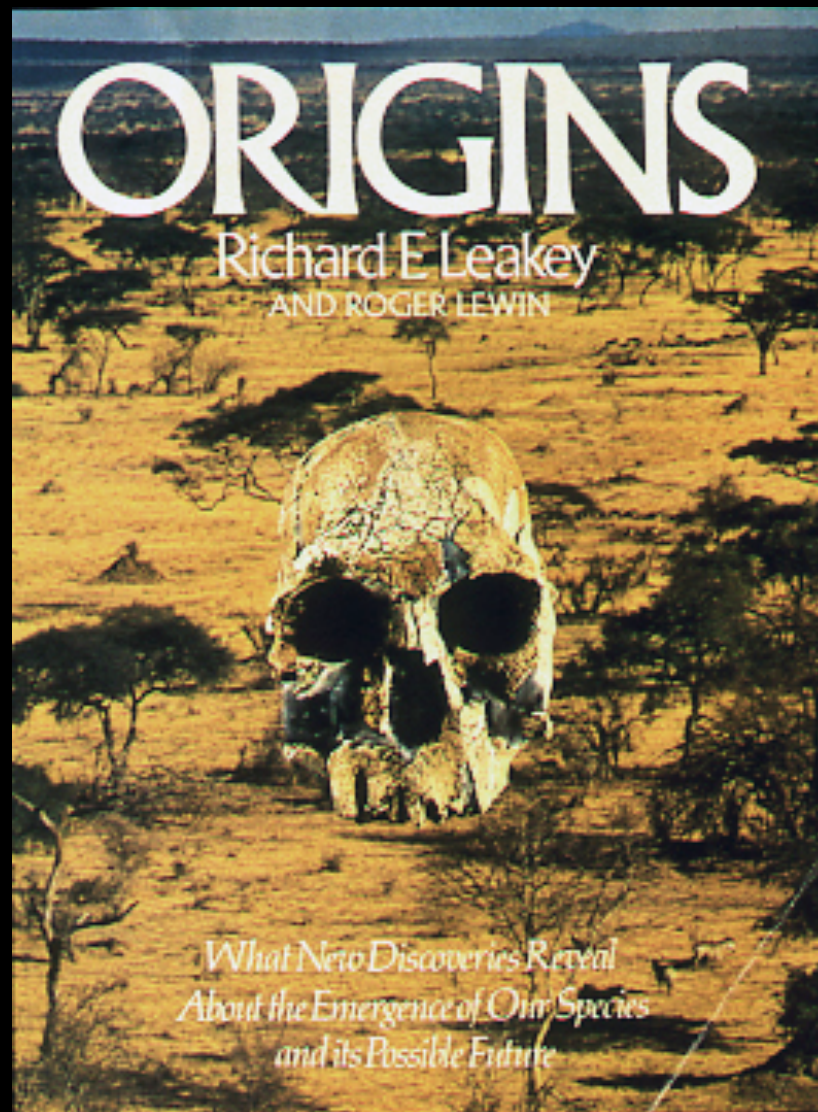
### 2007: Gallup Poll

In the spring of 2007, following an all-candidates meeting of ten Republicans seeking the presidency, three denied a personal belief in evolution. This prompted the *Gallup Organization* to ask American adults between 2007-MAY-21-24: "Do you, personally, believe in evolution or not." This is one of the poorest polling questions that we have ever seen, because people generally hold one of three beliefs concerning origins:

As expected, political affiliation reflects a difference of opinion on origins:

- Only 30% of Republicans believe in "evolution;" 68% do not.
- 61% of independents believe in "evolution;" 37% do not.
- 57% of Democrats believe in "evolution;" 40% do not.

The five main reasons why people say they do not believe in "evolution" are their belief [Jesus Christ](#), belief in [God](#), "due to my [religion](#) or faith," "not enough evidence," and belief in the [Bible](#).



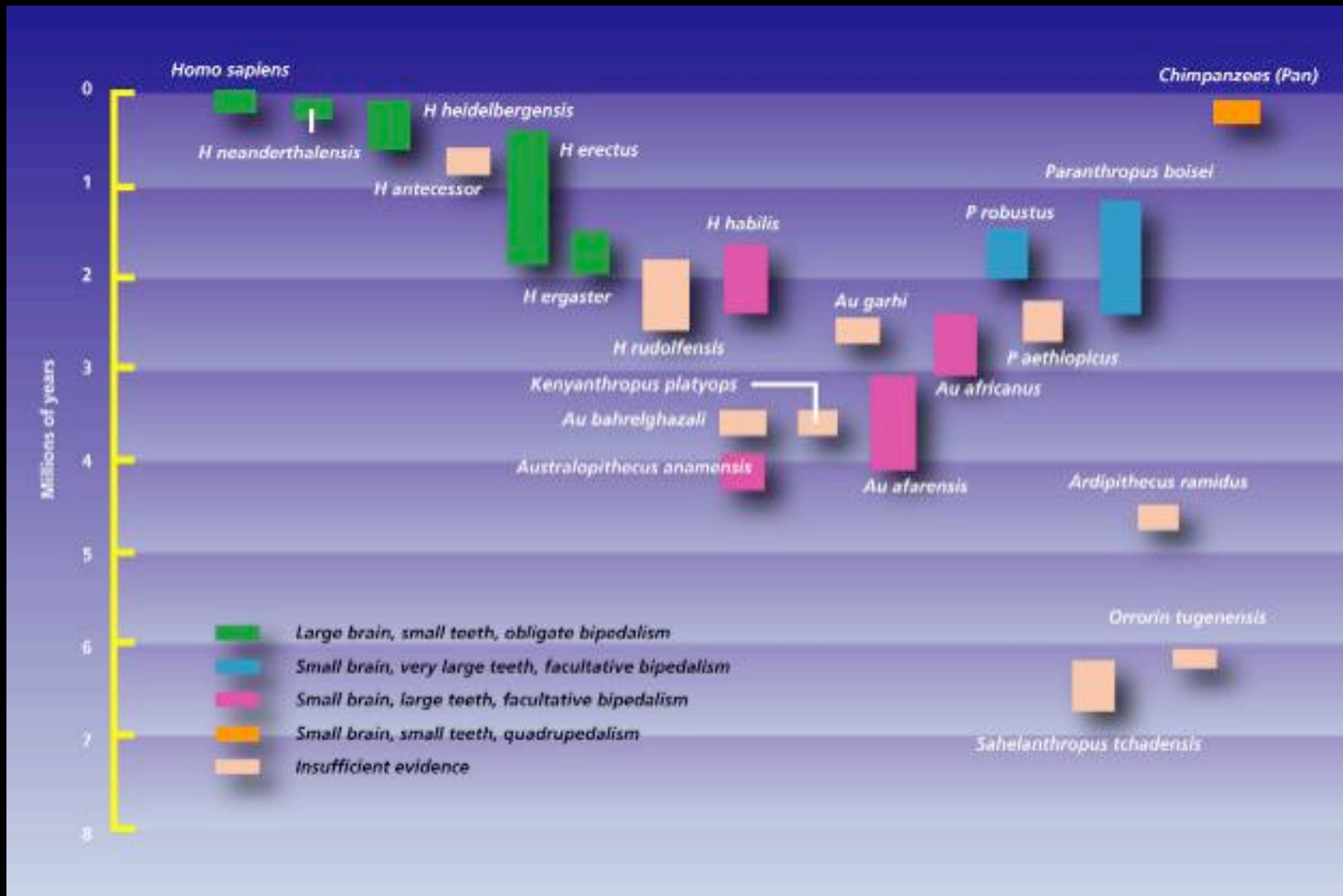
Richard Leakey. 1977. *Origins*: cover



Plesiadapis, prosimian, 58-55 mya, early Age of Mammals  
took to the trees → grasp, eyesight, hold body in vertical position

Richard Leakey. 1977. *Origins*: p. 39

# Human Evolution Timeline Chart



This appears to be based on Wood B. 2010. 'Reconstructing', minus H. floresiensis, near H. erectus.  
<http://www.talkorigins.org/faqs/homs/species.html>

# Patterns of Primate Evolution

1. Prosimians (Tarsiers, Lemurs) → Monkeys (Platyrrhini, Cercopithecoidea) → Hominoidea = Hylobatidae (gibbons or lesser apes) + Hominidae (great apes: orangutan, gorilla, chimpanzee)
2. Hominini (excl. chimp., B. Wood) or pre-Australopithecines (7-4.5 mya): *S. tchadensis*, *O. tugenensis*, *A. ramidus* → *Australopithecus anamensis*; *afarensis*; *africanus* → *Homo* sp; *Homo habilis*; *rudolfensis* + *Paranthropus*
3. *Homo ergaster*; *erectus*; *floresiensis* → *Homo antecessor*; *heidelbergensis*; *denisova* → *Homo helmei*; 'archaic' *Homo sapiens*; *Homo neanderthalis* + *Homo sapiens sapiens*
4. → ????



# Evolution – The Basic Concept Transformations

## 1. Adaptation

- behavioral strategies in inter- & conspecific competition (predator-prey, host-parasite, plant-herbivore, etc.);

## 2. Mutation

- intra- or interspecies mosaic features or quasispecies in morphogenetic field; transposons; (genetic inheritance-1)

## 3. Selection

- external & internal forces of extinction; natural, sexual and multileveled (group); differential survival rates in pop. dynamics

## 4. Speciation

- allopatric, peripatric, parapatric, sympatric radiation; ecological diversity; (genetic inheritance-2)

## 5. Meme

- to virtually and in praxis inhabit novel or ideal (template, schema) mutations of cultural practice
- meme generally defined as ‘a unit of cultural information, practice or idea transmitted verbally or by repeated actions’

## 6. Species or Group Ontogenesis

- increasing differentiation and complexity

## 7. Social-Mental *Habitus*

- superego, Bourdieu *habitus* objectified social structure ‘in us’, social habits

## 8. Individual Ontogenesis

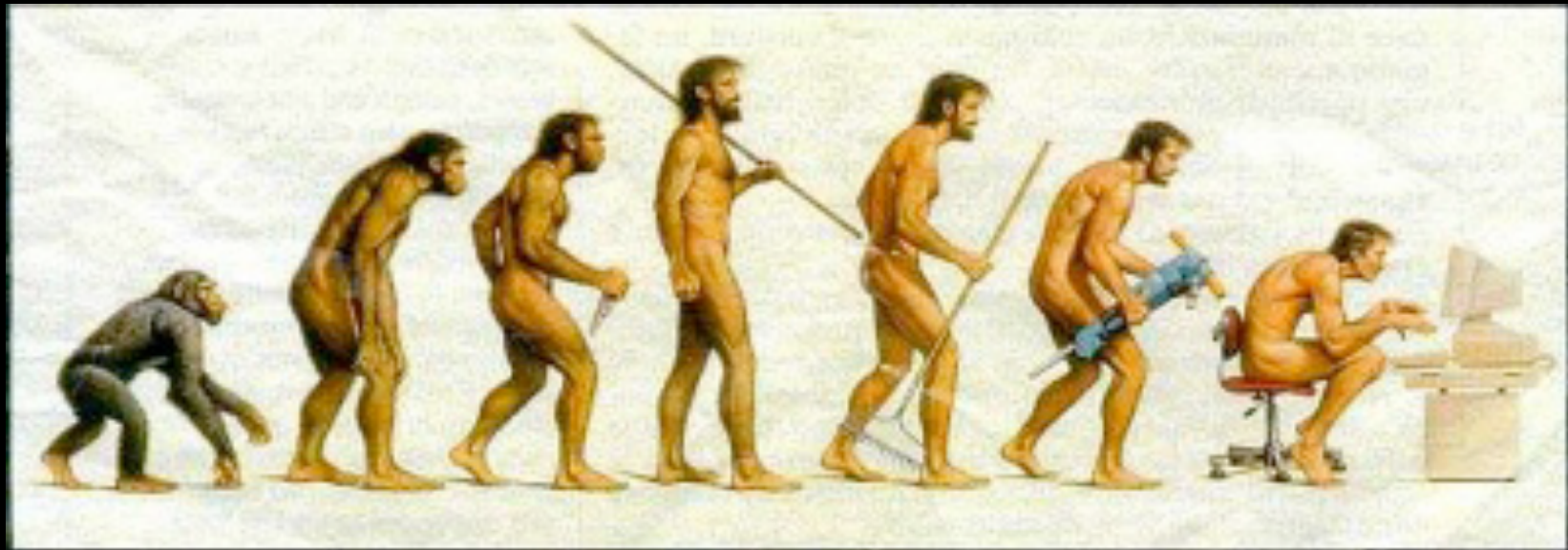
- increasing differentiation, in relationship dyads

## 9. Niche Construction – as perturbation and relocation

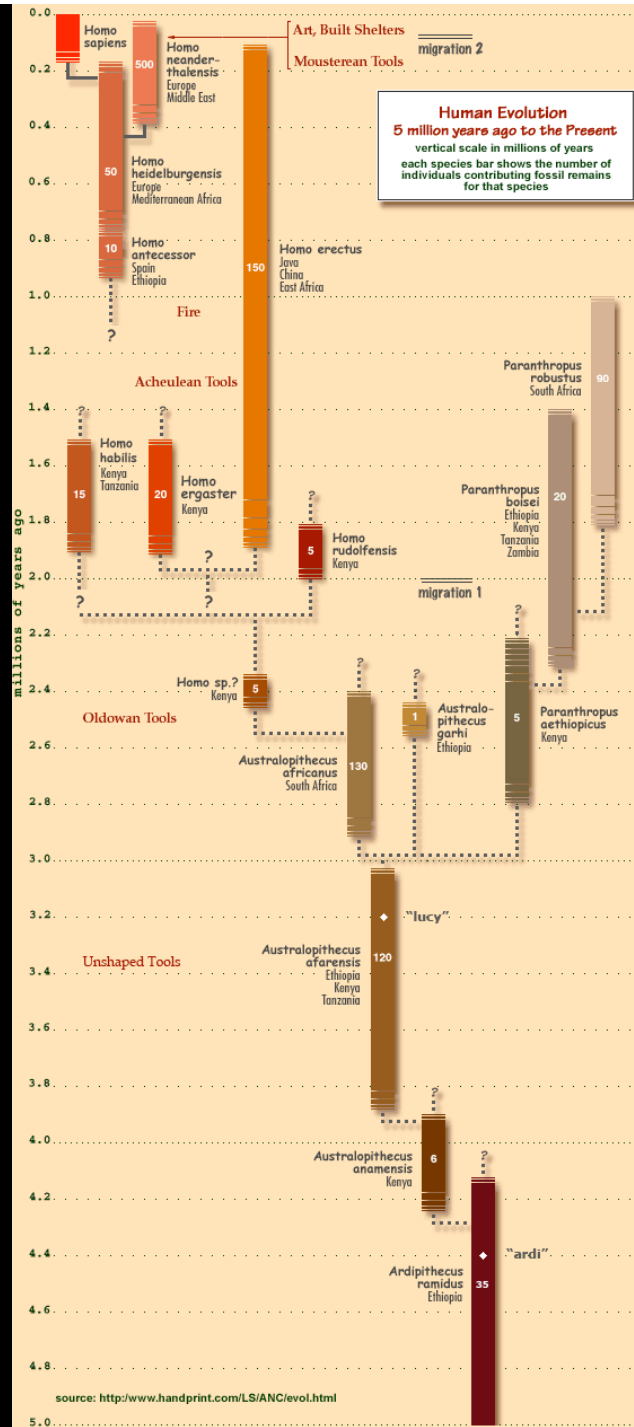
## 10. Niche Construction – as tool innovation for resource extraction

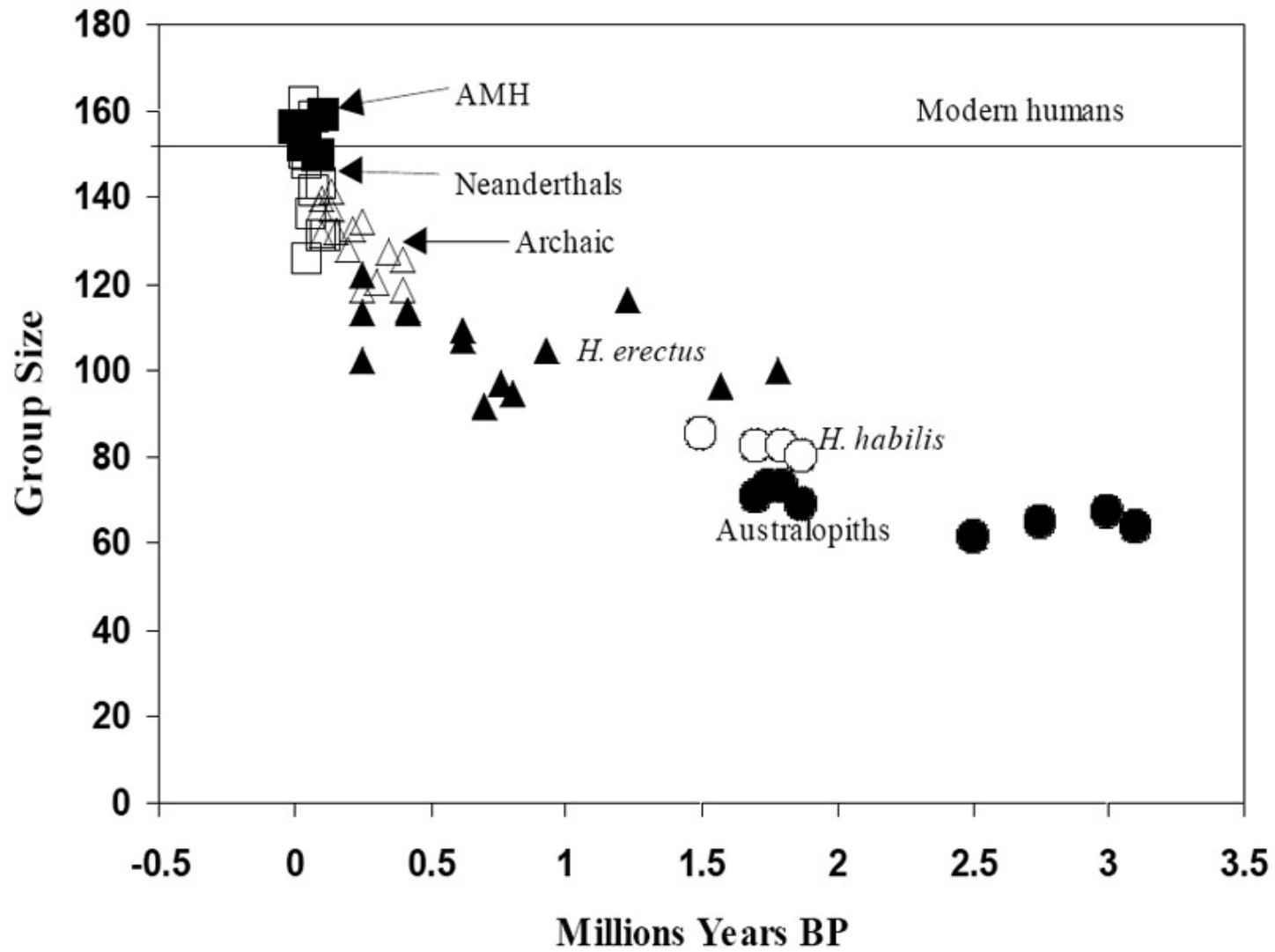
## 11. Epigenetic Inheritance – Transgenerational -- ‘detection-based’ via cells

## 12. Epigenetic Inheritance – Selection -- ‘selection-based’ via cells adaptive information



Somewhere, something went terribly wrong...



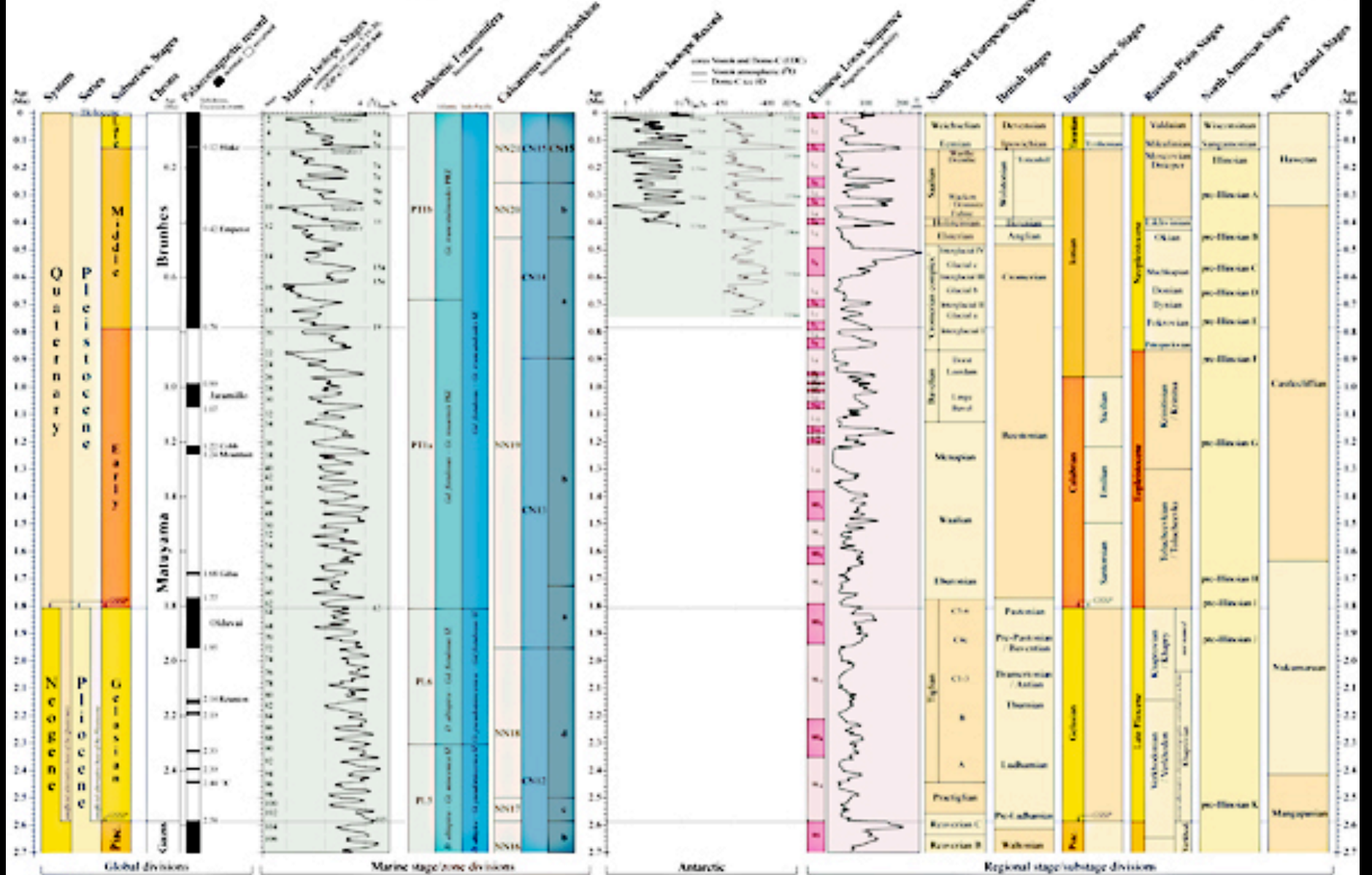


(R. Dunbar's extended brain hypothesis)

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# Global chronostratigraphical correlation table for the last 2.7 million years

v. 2004 b

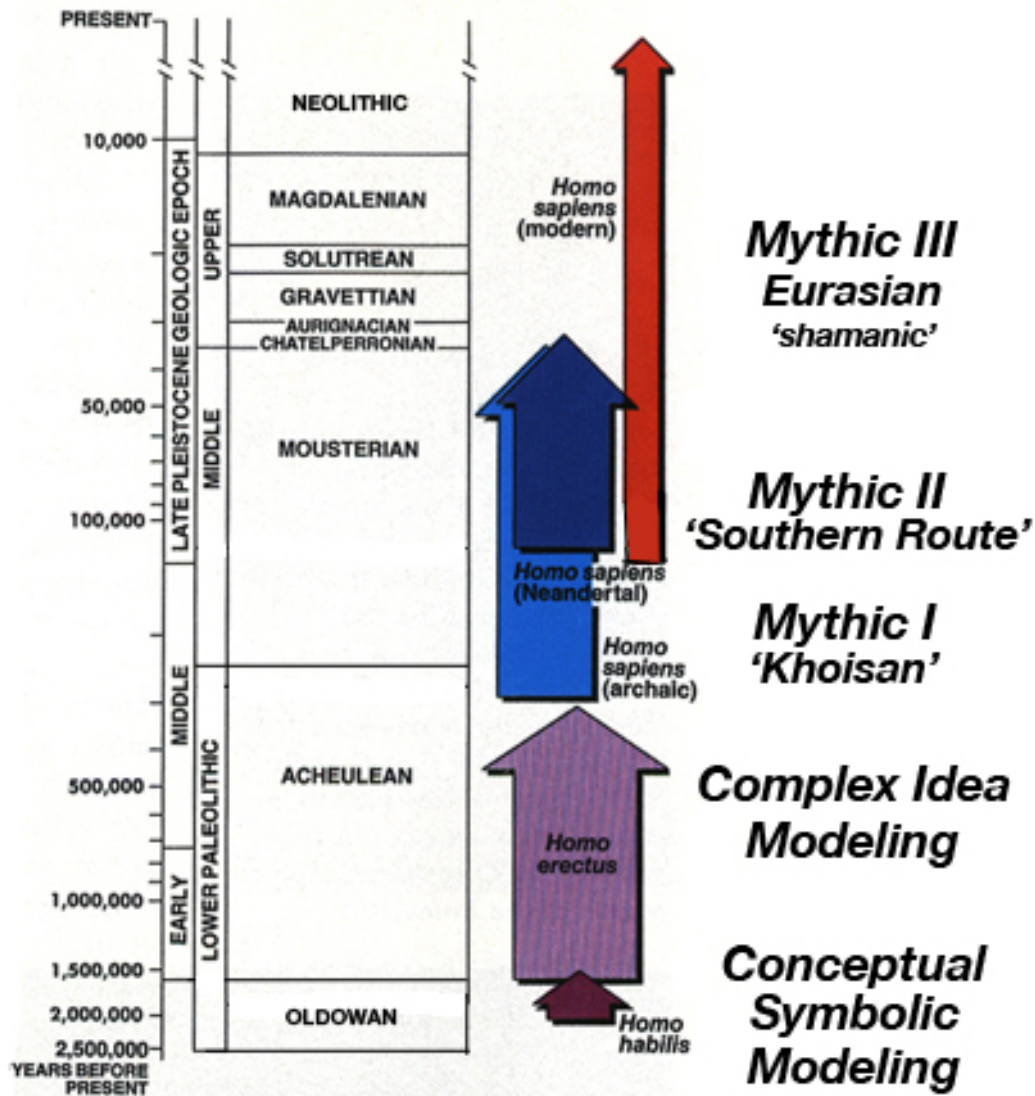


# Symbolic Behaviors – Taxonomy

- **Collection/manuporting/curation of exotic objects** - crystals, fossils, shells, non-local stone with 'aesthetic qualities'
- **Exotic tools** - made using exotic or 'aesthetic' materials, 'aesthetic' shapes, special degree of workmanship, etc., possibly exchange or status goods
- **Regional tool styles**
- **Use of pigment**
- **Self-adornment** - perforated objects, beads, pendants, ornaments
- **Pecked, abraded, incised, serrated or notched objects** - bone, stone, ochre, eggshell, wood
- **Geometric artifacts** - circular and discoid objects, spheroids, rhomboids, triangles, etc.
- **Marking traditions** - 'cupules', geometric shapes, evidence of 'geometric signs', protolanguage; symbolic notation systems
- **Spoken language** - circumstantial evidence
- **Image representation** - engraved, painted or sculpted anthropomorphic, zoomorphic or abstract figures
- **Musical instruments or locations** with special acoustic features
- **Gesture, mime and dance forms** - identifiable by circumstantial evidence: dance floors, footprints, etc.
- **Stone/bone arrangements/depositions** - heaps of stones or bones, cairns, geoglyphs, deposition of stone/bone in special places
- **Symbolic places/landscape art** (unusual or numinous landscape features, which might have had mythic or ceremonial significance, such as a vista, large boulder or rock formation, rock shelter, rockhole, gully, knoll, ridge, alluvial flat, and less visible features such as tree or bush, natural depression, rock face, hillside, path, interconnected pathways, or cleared areas—and for which evidence circumstantial)
- **Mortuary practice** - defleshing, bone modification, cannibalism, depositions, burials with or without grave goods, ochre, ritual objects

[derived from McBrearty and Brooks (2000) and Bednarik (2003, 1995, 1993), with modifications and additions]

# MYTHO-STRATIGRAPHY



# Old Paradigm: 'Big Bang Creative Explosion'

Recent Out-of-Africa Model (ROM) Falsified by Evidence

Component	Old Paradigm	True / False
Date	45 ka (Klein); 45-50 (Mellars; Bar Yosef); 30-60 (Mithen); MIS4 59-74 ka (Field, Petraglia & Lahr)	<b>No, 3 waves O-of-A H.s.s. ~125 kya</b>
Paleontology	<i>Homo sapiens sapiens</i> ('anatomically modern <i>Homo sapiens</i> ' replaces earlier archaic forms of <i>Homo sapiens</i> across Eurasia)	Replacement Questionable
Genetics	Y-DNA haplogroups C and D + mtDNA M and N	Mutation Rate Clock questionable
'Behavioral Modernity'	Package of 'modern' behaviors, including the following	<b>No package, innovations over 2 mya</b>
Technology	Mode IV Upper Paleolithic/Later Stone Age (blade and burin, backed blades, microblade cores and blades); novel materials: bone, antler; regional tool styles, first steps in coastal navigation and seafaring	Mode IV origin Cen. Asia or multiregional
Language	Language capacity is 'Modern', FOXP2 mutation	No, evolving language capacity from 2 mya
Behaviors	Range extension; long-distance resource procurement & exchange of goods; intensified resource extraction, especially aquatic and veggies using specialized technologies	No, earlier, at least MP/MSA or <i>H. erectus</i>
Symbolic Behavior	Self-adornment (beads, pigment colorants); incised objects; image representation; symbolic notation systems; musical instruments; burials with grave goods, ochre, ritual objects	From 2 mya



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# A New Paradigm

- Wave I: Dispersal of *Homo rudolfensis/habilis*, with classic Oldowan pebble-core tool tradition, out-of-Africa, ~2.0 Ma to 1.7 Ma

- Wave II: Dispersal of *Homo erectus*, with Middle Acheulian or Developed Oldowan-like tool tradition, out-of-Africa, ~1.0 Ma to 800 ka

- Wave III: Dispersal of *Homo sapiens* out-of-Africa or SW Asia with Mid-Middle Paleolithic technology, ~150 to 60 ka

- Wave IV: Upper Paleolithic → 60 ka Global Rock Art Heritage

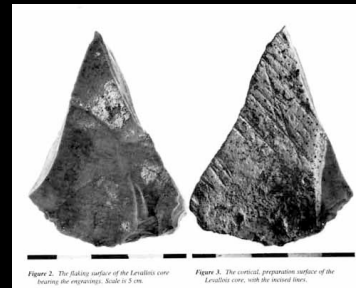
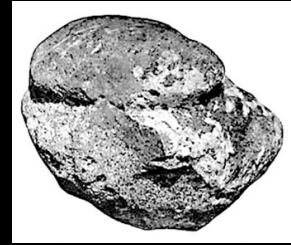


Figure 2. The flaking surface of the Levallois core showing the enlèvement. Scale is 3 cm. Figure 3. The vertical, preparation surface of the Levallois core, with the lateral scars.





## Global Rock Art Heritage by 60,000 BP

Africa, India, Australia, China, Europe, Siberia,  
North and South America

# Models of Evolution of Art, Symbol & Myth

<i>Era and Techné</i>	<i>Merlin Donald (1998, 1993, 1991)</i>	<i>Steven Mithen (1996)</i>	<i>Four Meme Model James Harrod</i>
<b>Oldowan</b> EO ~2.6 to 2.0 Ma 'Classic' ~2.0 to 1.4 Ma Developed ~1.7 to 1.2 Ma	Episodic Culture 2.2-1.5 Ma = great ape perceptual modeling of events; episodic, procedural memory	(modular theory) Social intelligence General intelligence	' <b>Rudimentary Symbolic</b> ' = 2.0-3.5 yrs // human = great ape cognition (A. Russon 2004)  <b>Conceptual-Symbolic Modeling</b>
<b>Acheulian</b> <i>(sensu lato)</i> EA ~1.7 to 1.0 Ma MA ~1.0 Ma to 500 ka LA ~650 to 200 ka FA ~300 to 150 ka	Mimetic Culture 4.0-0.4, peak 1.5 Ma = <i>Homo erectus</i> emblematic gesture, vocal modulation, prosody, rhythm, self-image, mime, dance, toolmaking	1.8 Ma = <i>Homo erectus</i> Technical intelligence Natural history intelligence	<b>Complex Idea Modeling</b>
<b>Middle Paleolithic / Middle Stone Age</b> EMP ~300 to 40 ka MMP ~150 to 60(100) ka LMP ~60 to 30/35 ka	Mythic Culture 500 ka-present = <i>archaic Homo sapiens</i> logic, symbolic invention; lexical and phonological capacity, narrative storytelling, myth	500 ka = <i>archaic Homo sapiens</i> Language module	<b>Mythic I &amp; II</b> EMP = <i>archaic Homo sapiens</i> MMP = <i>Homo sapiens sapiens</i> ' <b>Gaia</b> ' = <b>Khoisan</b> ' <b>Gondwana</b> ' = ' <b>Southern Route</b> ' (M. Witzel)
<b>Upper Paleolithic / Later Stone Age</b> EUP ~60 to 150 ka MUP ~40 to 20 ka LUP ~25 to 10 ka	Theoretic Culture 100-50 ka = <i>Homo sapiens sapiens</i> visuo-symbolic or graphic invention recent: writing, external symbolic storage; theory construction	Cognitive fluidity 60-30ka = <i>Homo sapiens sapiens</i> 'big bang cultural explosion', art & religion	<b>Mythic III</b> <i>Homo sapiens sapiens</i> ' <b>Laurasian</b> ' = <b>Shamanic</b>

# 4 Meme Model: 2MY Evolution of Art, Symbol & Myth

<i>Era and Techné</i>	<i>Four Meme Model</i> (James Harrod)
<p><b>Oldowan</b>                      EO ~2.6 to 2.0 Ma                      'Classic' ~2.0 to 1.4 Ma                      Developed ~1.7 to 1.2 Ma</p>	<p>'Rudimentary Symbolic' = 2.0-3.5 yrs // human = great ape cognition (A. Russon 2004)                      = <i>Australopithecus</i> (similar cognitive level by triangulation to common great ape ancestor)                      First 'art object': 'animacy in stone'; 'animated spirit that inhabits this body'</p> <p><b>Conceptual-Symbolic Modeling</b> = <i>Homo habilis/rudolfensis</i> (out-of-Africa)                      First Metaphor = 'core-seed-sustenance-essence in interpersonal interaction'; 'rhomboids of the mind'                      First Joke = 'hit the baboon head' anvil (drill cupules)                      First Ethos = carnivore axis</p>
<p><b>Acheulian</b>  <i>(sensu lato)</i>                      EA ~1.7 to 1.0 Ma                      MA ~1.0 Ma to 500 ka                      LA ~650 to 200 ka                      FA ~300 to 150 ka</p>	<p><b>Complex Idea Modeling</b> = <i>Homo erectus/ergaster</i> (out-of-Africa)                      Biface pairing of complementary shapes (<i>contraria sunt complementa</i>, Niels Bohr; <i>coincidentia oppositorum</i>, C. G. Jung; 'co-poiesis', Bracha Ettinger)                      Sheath, the Womb Source of Animacy (Life-Giver) &amp; Vehicle, Cutting Spirit, Energy of Initiative (Death-Giver)                      colorants, marking traditions, mortuary practice, adornments, anthropomorphs &amp; zoomorphs</p>
<p><b>Middle Paleolithic / Middle Stone Age</b>                      EMP ~300 to 40 ka                      MMP ~150 to 60(100) ka                      LMP ~60 to 30/35 ka</p>	<p><b>Mythic I &amp; II</b> EMP = <i>archaic Homo sapiens</i> / MMP = <i>Homo sapiens sapiens</i> (out-of-Africa)                      Beings of the Dreaming, Creatrix of Life-Forms, stone arrangements, landscape art, image representation, mortuary practices with grave goods; geometric 'signs'</p> <p>I. 'Gaia' (M. Witzel) = Khoisan</p> <p>II. 'Gondwana' (M. Witzel) = 'Southern Route' Africa to SE Asia &amp; Australia</p>
<p><b>Upper Paleolithic / Later Stone Age</b>                      EUP ~150 to 60 ka                      MUP ~40 to 20 ka                      LUP ~25 to 10 ka</p>	<p><b>Mythic III</b> = <i>Homo sapiens sapiens</i> (out-of-SW-Central-Asia)                      'Eurasian' (Y. Berezkin) 'Laurasian' (M. Witzel) = Shamanic</p> <p>6 Worlds Shamanism; Soul Journey, Soul Retrieval; Mother-of-Animals, Master-of-Animals;                      Geometric Protolanguage, UP(E) array of 12 female and 12 male spiritual transformations (J. Harrod)</p>

Templeton (2010, 2002): genetics = 3 waves out-of-Africa – 1.9 Ma; 650 ka; 130 ka; 1 out-of-Asia (recent)

- **4 Waves of Technological Globalization /  
Dispersal over 2 Million Years**

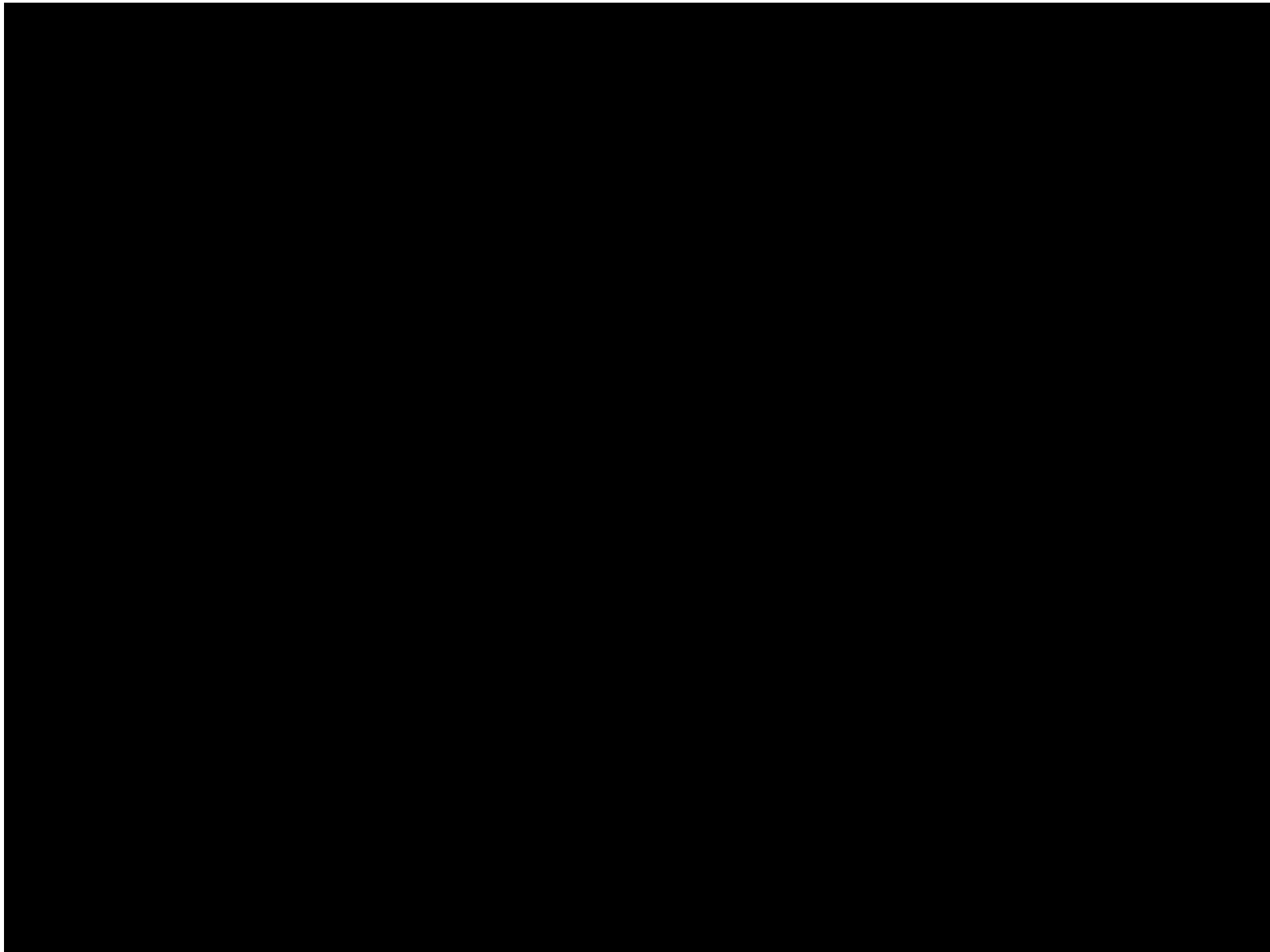
3 Waves Out-of-Africa; 4<sup>th</sup> Wave – possibly Out-of-Central-Asia  
Short chronology (ROM) – Old Paradigm, Not Supported

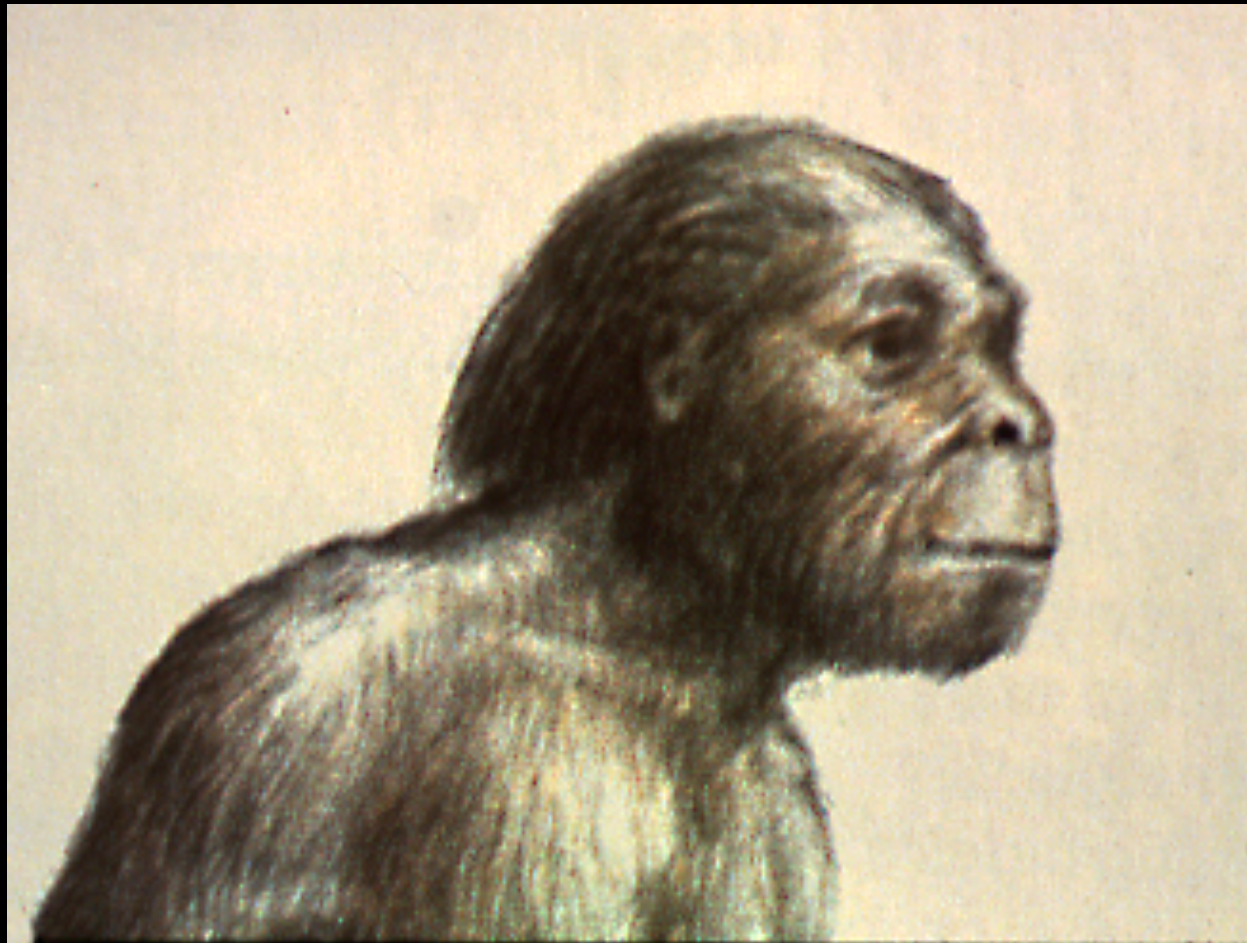
- **Long Chronology of Symbolic Behavior  
Evolving over 2 Million Years**

2 million years of 'behavioral modernity'

- **4 Memes for Symbol, Metaphor and Myth**

one for each stage of globalization





*Australopithecus africanus*

Richard Leakey. 1977. *Origins*: p. 95



# Preliminary Staging for the 1<sup>st</sup> Meme

<i>Era and Techné</i>	<i>Setting the Stage for the 1<sup>st</sup> Meme</i>
<p>'Rudimentary Symbolic'</p>	<p>'Rudimentary Symbolic' = // human at 2.5-3.5 yrs = Great Ape Cognition (A. Russon 2004):</p> <ul style="list-style-type: none"> <li>• Quantified reciprocity (cooperation, favors, retaliation), empathy</li> <li>• Indirect self recognition in picture or shadow</li> <li>• Analogical reasoning between relations, part/whole relations</li> <li>• Program level imitation</li> <li>• Re-enact scripts, basic and advanced symbolic play, role play, demonstration teach</li> <li>• Pantomime intent, request, story (A. Russon 2010)</li> </ul> <ul style="list-style-type: none"> <li>• Communicative behaviors: vocalizations and displays (J. Goodall 1986)</li> <li>• Tool use in gathering/foraging (J. Goodall 1986; Whiten et al 1999)</li> <li>• Hunting of prey animals (monkey, small antelopes, wild pigs, baboon, squirrel, rodents); murder of separatist/colonials, cannibalism (J. Goodall 1986; Boesch &amp; Boesch 1989; Surbeck &amp; Hohmann 2008))</li> <li>• Natural hammer &amp; anvil nutcracking (Boesch &amp; Boesch 1982)</li> <li>• Natural cleaver use for fruit-cracking (Koops et al 2010)</li> </ul> <ul style="list-style-type: none"> <li>• Female predominate culture transmitter (Boesch &amp; Boesch 1981; McGrew 1981; Boesch et al 1994; Lonsdorf et al 2004; Lind &amp; Lindenfors 2010; compare Greenspan &amp; Shankar, <i>The First Idea</i>, 2004)</li> </ul> <ul style="list-style-type: none"> <li>• Religious behaviors (chimpanzee ritualizations for birth, death, consortship, reverence for natural world, e.g., rain &amp; wind dance, water watching, fire, earthquake – 4 elements, sunrise, sunset) (Harrod 2010 in press; 2009 online)</li> </ul> <p><i>Australopithecus</i> – similar cognitive level by triangulation to common great ape ancestor (Whiten, Schick &amp; Toth 2009; Gowlett 2009).</p>

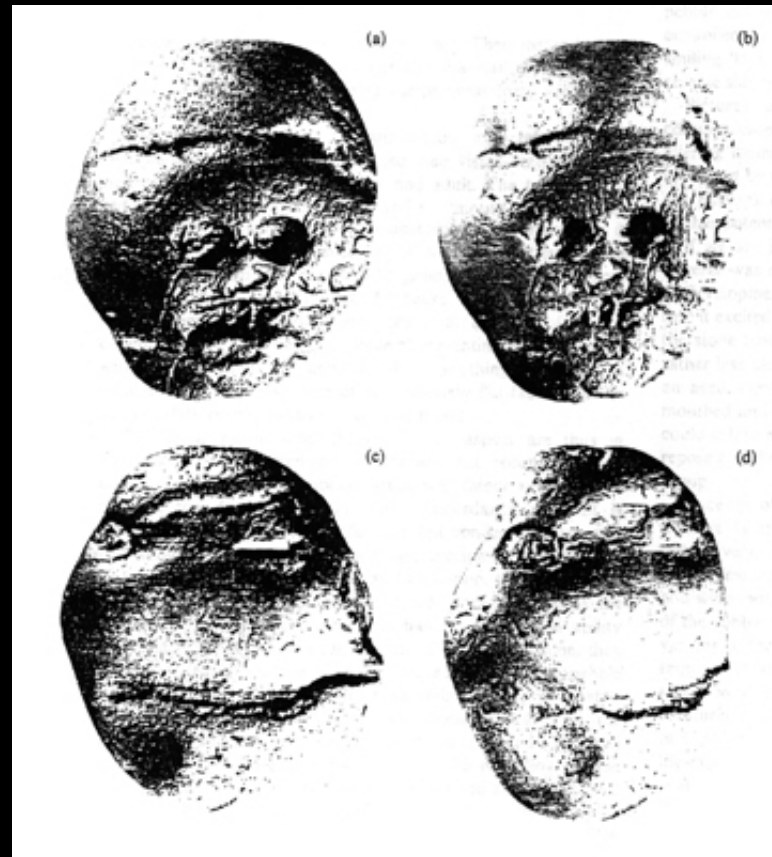


## Makapansgat Pebble

Red Jasperite, Limeworks Cave, Makapansgat, South Africa

Level 3 Bone Breccia/Partridge's Member 4; *Australopithecus africanus* (2.58-2.85 Ma; *palaeomag.* Herries et al 2010)

*Photo: Robert G. Bednarik; microscopic examination, all markings natural (Bednarik 1998; 1999)*

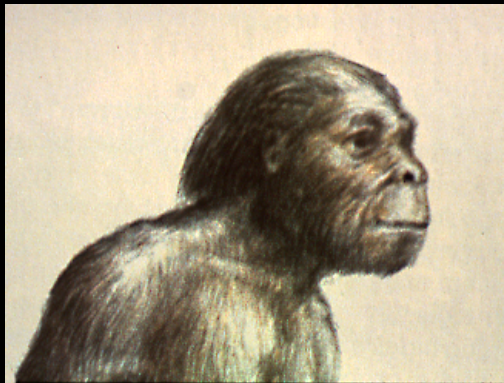


## 'Pebble of Many Faces'

Red Jasperite, Limeworks Cave, Makapansgat, South Africa,  
Level 3 Bone Breccia/Partridge's Member 4; *Australopithecus africanus* (2.58-2  
Ma; palaeomag. Herries et al 2010)

Dart, Raymond (1974)





## 'Pebble of Many Faces'

Red Jasperite, Limeworks Cave, Makapansgat, South Africa,  
Level 3 Bone Breccia/Partridge's Member 4; *Australopithecus africanus* (2.58-2.85 Ma; *palaeomag. Herries et al 2010*)  
Dart, Raymond (1974); Leakey, Richard, *Origins* 1977: p. 95

# The Ground of the Evolution of Art, Symbol & Myth

Era and Techné	Ground of the 1 <sup>st</sup> Meme : 'Found Art' = <i>Australopithecus</i>
<p>'Pre-Oldowan' &gt; ~2.5 Ma</p>	<p><i>Australopithecus</i> – similar cognitive level by triangulation to common great ape ancestor</p> <ul style="list-style-type: none"> <li>• First artwork: 'found art': red jasperite cobble, natural 'figurine of many (3) faces' Makapansgat M4, ~2.58-2.85 Ma, <i>A. africanus</i> (Dart 1974; Bednarik 2003; date palaeomag. Harries et al 2010)</li> </ul> <p><b>First 'art' concept: 'Found Art'</b></p> <ul style="list-style-type: none"> <li>• Communicative gesture – to show, display – Curate</li> <li>• Delight in seeing and being seen – Eye-gazing</li> <li>• 'Pathos' of life-stages, finitude in eternity</li> <li>• Sense of animacy ('this stone is alive'; 'animated spirit that inhabits this body'; '<i>élan vital</i>')</li> </ul> <p>Neural substrate differentiable from pareidolia. (Hadjikhani, Kveraga et al 2009; shows Fusiform Face Area combines with biomotion-in-social-interaction 'animacy' network to differentiate faces and face-like-objects at 165 ms in immediate recognition process, not in post-recognition reinterpretation).</p> <ul style="list-style-type: none"> <li>• ? First flake tool use: Bouri, ~2.5 Ma, <i>A. garhi</i> (Heinzelin et al 1999); ? Dikika, ~3.4 Ma, <i>A. afarensis</i> (McPherron et al 2010)</li> </ul>

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